

THE MILK PRODUCTION PERFORMANCES OF BARBARI, ANGLO-NUBIAN AND BARBARI × BLACK BENGAL GOATS UNDER INTENSIVE MANAGEMENT IN BANGLADESH

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Summary

The milk production of Anglo-Nubian, Barbari and Barbari × Black Bengal goats were compared. The respective average lactation yield of those genotypes were 171.27 ± 16.90 , 88.22 ± 8.67 and 52.31 ± 13.51 kg; mean annual milk yield 208.41 ± 24.57 , 117.13 ± 12.44 and 84.19 ± 23.45 kg; per day milk yield 0.82 ± 0.07 , 0.61 ± 0.05 and 0.43 ± 0.06 kg and lactation length 207.67 ± 7.36 , 143.89 ± 6.67 and 116.75 ± 13.86 days. All traits recorded were influenced significantly ($p < 0.01$) by the genetic group. Introduction of Barbari genes to Black Bengal goats had a positive effect in improving milk yield.

(Key Words: Milk Yield, Anglo-Nubian, Barbari, Barbari × Bengal)

Introduction

In Bangladesh the majority of people do not have cultivable land and for this reason are reluctant to rear cattle. However, they can not afford to purchase milk for babies and other household users. Therefore, there is interest by marginal farmers and landless people in the keeping of dairy goats in lieu of cattle to provide fresh milk for their households. Bangladesh has about 10.2 million goats (Huq, 1988), most of which are Black Bengal. However, their milk production is insufficient to nurse even their own kids. In these circumstances, increasing milk production of small ruminants such as dairy goats deserves research emphasis to alleviate the nutritional crisis prevailing among low income people. The keeping of dairy goats could be developed either by importing dairy breeds from neighbouring countries or by improving the milk production potential of the Black Bengal by crossing it with recognized dairy breeds. The present study compared the milk yield parameters of Anglo-Nubian, Barbari and Barbari × Black Bengal goats under intensive farm condition in Bangladesh.

Materials and Methods

Data in this study were available from twelve Anglo-Nubian, nine Barbari and four Barbari × Black Bengal goats kept between 1989 and 1991 at the Development Service Centre of the Bangladesh Mission, Serdagonj, Gazipur in Bangladesh. The Barbari × Black Bengal were F₁ crossbreds produced by crossing Barbari bucks with Black Bengal does. All the goats were of second perity and the age of Anglo-Nubian, Barbari and Barbari × Black Bengal were 31.08 ± 1.50 , 25.37 ± 1.35 and 23.0 ± 0.08 years, respectively. The goats were managed under intensive husbandry conditions. Throughout milking all goats were offered a daily ration of 500 g concentrate mix containing 125 g crushed wheat, 100 g rice polish, 75 g wheat bran, 105 g lentil bran, 40 g sesame oil cake, 50 g molasses and 5 g common salt in addition to *ad libitum* green fodder (road side grass, ipil-ipil, jack fruit leaves, para grass etc). Fresh drinking water was made available throughout the study period. All goats were housed in a wooden thatched tinshed with a wooden floor raised above the ground. There were sufficient provision for access to fresh air and free movement. The kids were allowed to suckle the dose from 7 AM to 5 PM daily up to 90 days of age. The goats were milked in the early morning, before the kids were allowed to suckle. Milk yield was measured by weighing

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daily the milk obtained by hand milking, from the date of kidding to the date of dry.

The data obtained on lactation yield, per day milk yield, lactation length and mean annual milk yield was analysed using an F-test (De-Ramos and David, 1977), and subclass means were compared using Duncan's New Multiple Range test. For analysis a Generalised Linear Model (GLM) program in the statistical Analysis System (SAS, 1985) computer package was used with the following model:

$$Y_{ij} = \mu + a_i + e_{ij}$$

Where, Y_{ij} is the observation on the j th individual of i th genetic group;

μ is the overall mean;

a_i is the effect of i th genetic group;

e_{ij} is the random residual effect specific to individual record normally distributed with mean 0 and variance σ_e^2 .

Results and Discussion

The means with standard errors for lactation yield, mean annual milk yield, per day milk yield and lactation length of Anglo-Nubian, Barbari and Barbari \times Black Bengal have been shown in table 1. ANOVA for data on these traits is presented in table 2. Duncan's New Multiple Range Test indicated that Anglo-Nubian had the highest ($p < 0.05$) lactation yield, mean annual milk yield, per day milk yield and lactation

TABLE 1. MEANS WITH STANDARD ERRORS FOR DIFFERENT MILK TRAITS STUDIED

| Parameters | Anglo-Nubian | Barbari | Barbari \times Black Bengal |
|-----------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|
| Lactation yield (kg) | 171.27 ^a \pm 16.90 (12) | 88.22 ^b \pm 8.67 (9) | 52.31 ^b \pm 13.51 (4) |
| Mean annual milk yield (kg) | 208.41 ^a \pm 24.57 (12) | 117.13 ^b \pm 12.44 (9) | 84.19 ^b \pm 23.45 (4) |
| Per day milk yield (kg) | 0.82 ^a \pm 0.07 (12) | 0.61 ^{ab} \pm 0.05 (9) | 0.43 ^b \pm 0.06 (4) |
| Lactation length (days) | 207.67 ^a \pm 7.36 (12) | 143.89 ^b \pm 6.67 (9) | 116.75 ^c \pm 13.86 (4) |

Means with different superscripts in the same row differed significantly ($p < 0.05$). Figures in the parentheses indicated number of observations.

TABLE 2. ANOVA FOR DIFFERENT MILK TRAITS STUDIED UNDER DIFFERENT GENETIC GROUPS

| Parameters | Degrees of freedom | | Mean square | | F value | Level of significance |
|------------------------|--------------------|---------------|----------------|---------------|---------|-----------------------|
| | Between groups | Within groups | Between groups | Within groups | | |
| Lactation yield | 2 | 22 | 29,415.71 | 2,059.69 | 14.28 | ** |
| Mean annual milk yield | 2 | 22 | 29,875.07 | 4,312.36 | 6.93 | ** |
| Per day milk yield | 2 | 22 | 0.2637 | 0.0420 | 6.27 | ** |
| Lactation length | 2 | 22 | 17,251.53 | 575.29 | 29.99 | ** |

** $p < 0.01$.

length. No significant difference was noticed in lactation yield and mean annual milk yield between Barbari and Barbari × Black Bengal. The per day milk yield of Barbari did not differ significantly from others. The lactation length of Barbari was significantly higher ($p < 0.05$) than that of Barbari × Black Bengal. Genetic group had highly significant ($p < 0.01$) effect on all the milk traits studied. Similar significant effect of genetic group was observed by Yadav et al. (1983) and Kanaujia et al. (1988) on lactation yield; Agrawal and Bhattacharyya (1978) on per day milk yield; and Garcia et al. (1978) on lactation length. The above findings were in confirmation with the findings of the present study.

The observed lactation yield of Anglo-Nubian was lower than that reported by Delaitre (1965) and Devendra (1962) but higher than that reported by Vellegas (1932, 1933), Devendra et al. (1969) and Garcia et al. (1977). Yadav et al. (1983) reported lower lactation yield of Barbari compared to the present investigation but Lall and Singh (1949) and Slater and Bhatia (1935) reported higher values. The lactation yield and per day milk yield of Barbari in the present investigation was close to the finding of Barhat and Chowdhary (1978). Observed per day milk yield of Anglo-Nubian was in agreement with the findings of Devendra (1962) but in case of Barbari × Black Bengal it was lower than that reported by Agrawal and Bhattacharyya (1978). Non-significant difference in per day milk yield between Barbari and Barbari × Black Bengal was in agreement with the findings of Agrawal and Bhattacharyya (1978). Barhat and Chowdhary (1978) and a report of Pakistan (1970) indicated lower lactation length of Barbari compared to the present study but Lall and Singh (1949) and Slater and Bhatia (1935) reported higher values. The observed lactation length of Anglo-Nubian was lower than that reported by Delaitre (1965), Vellegas (1932, 1933), Devendra (1962) but higher than that observed by Devendra et al. (1969). The lactation length of Anglo-Nubian in the present study was in accordance with the findings of Garcia et al. (1977). The difference in lactation yield and lactation length reported by various investigators may be attributed to interaction of genotype and environment in different agro-climatic zones. The crossbred Barbari × Black Bengal had only a slightly lower ($p > 0.05$) lactation

yield, mean annual milk yield and per day milk yield than Barbari. The results indicated the interest of grading up the Black Bengal population with the Barbari goat, or something similar but these first results need to be confirmed on a bigger sample.

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